



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,570	07/21/2006	Robert W. Morris	30004-004US1	2103
69713	7590	10/07/2008	EXAMINER	
OCCHIUTI ROHLICEK & TSAO, LLP 10 FAWCETT STREET CAMBRIDGE, MA 02138				BORSETTI, GREG
ART UNIT		PAPER NUMBER		
2626				
			NOTIFICATION DATE	
			DELIVERY MODE	
			10/07/2008	
			ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

INFO@ORTPATENT.COM

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/565,570	MORRIS, ROBERT W.	
	<b>Examiner</b>	<b>Art Unit</b>	
	GREG A. BORSETTI	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 24 July 2008.

2a) This action is **FINAL**.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-18 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

1. Claims 1-18 are pending.
2. Claims 1, 17, and 18 were substantially amended.
3. New art has been applied because the interview (6/3/2008) determined that the amendments would overcome the cited prior art.

### ***Claim Objections***

4. Claim 1 objected to because of the following informalities: "one or more spoken instance" should be rewritten as "one ore more spoken instances". Appropriate correction is required.
5. Claim 1 objected to because of the following informalities: There should be a space between "claim" and "1". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claim 17 of the claimed invention is directed to non-statutory subject matter. The preamble of the claim specifically directs the claim language to software, which does not fall within one of the statutory categories under 35 USC 101. The examiner suggests amending the preamble to "A computer-readable medium storing software comprising instructions for causing a processing system to:". Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-15, 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. (US Patent #5797123 hereinafter Chou) in view of NPL document ("An overview of audio information retrieval" hereinafter Foote).

As per claim 1, Chou teaches the method comprising:

accepting first query data representing one or more spoken instances of a query in a first set of audio signals; (Chou, columns 4-5, lines 65-67 and 1-9, ....*In particular, this sentence hypothesis verification process is performed with a "partial input" comprising fewer subwords than are found in the entire utterance...* The input is an utterance which is a spoken instance of a query which is received.)

processing the first query data including determining a representation of the query that defines multiple sequences of subword units each representing the query; (Chou, column 5, lines 60-65, ...*The subword model recognizer employed by key-phrase detector 11 uses lexicon 23 and subword models 22, which may have been*

*trained based, for example, on a conventional minimum classification error (MCE) criterion, familiar to those skilled in the art...)*

Chou fails to fully teach, but Foote teaches:

accepting second speech data representing unknown speech in a second audio signal; and (Foote, abstract, ... *This paper reviews the state of the art in audio information retrieval, and presents recent advances in automatic speech recognition, word spotting, speaker and music identification, and audio similarity with a view towards making audio less “opaque”...* Audio information retrieval implies that there must be something to be retrieved from some audio signal. The second speech data is the source audio data to be searched.)

locating putative instances of the query in the second speech data using the determined representation of the query. (Chou teaches the use of subword spotting for recognition. Foote further provides in sections 2.1 and 2.2 the use of keyword spotting with subunits for the purposes of information retrieval.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Foote with the Chou device because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Foote provides the use of subunit word spotting for information

retrieval where Chou could further provide the method for word spotting as is recited in the claim language.

As per claim 2, claim 1 is incorporated and Chou further teaches the method comprising:

applying a computer-implemented speech recognition algorithm to the query data. (Chou, column 4, lines 30-42, ...*subword-based speech recognition...*)

As per claim 3, claim 1 is incorporated and Chou further teaches the method comprising:

the subword units include linguistic units. (Chou, column 4, lines 23-33, ...*syllables, demisyllables, or phonemes...*)

As per claim 4, claim 2 is incorporated and Chou further teaches the method comprising:

applying a computer-implemented word spotting algorithm configured using the determined representation of the query. (Chou, column 5, lines 10-19, ...*Typical word spotting schemes as described above use small templates that can easily be triggered by local noise or confusing sounds. Using longer units of detection (i.e., key-phrases instead of just keywords) is advantageous because it tends to incorporate more distinctive information, resulting in more stable acoustic matching, both in the*

*recognition phase and in the verification phase..., Chou teaches the matching of phrases of words, therefore teaches word spotting.)*

As per claim 5, claim 4 is incorporated and Chou further teaches the method comprising:

selecting processing parameter values of the speech recognition algorithm for applications to the query data according to the characteristics of the word spotting algorithm. (Chou, column 5, lines 27-49, *...the key-phrases may be defined so as to directly correspond with semantic slots in a semantic frame, such as, for example, a time and a place.... the top-down key-phrases recognized by the instant illustrative embodiment may easily be directly mapped into semantic representations..., the key-phrase detector tags detected phrases with conceptual information for further consideration by the speech recognition algorithm.)*

As per claim 6, claim 5 is incorporated and Chou further teaches the method comprising:

wherein the selecting of the processing parameter values of the speech recognition algorithm includes optimizing said parameters according to an accuracy of the word spotting algorithm. (Chou, column 5, lines 60-67, *...conventional minimum classification error (MCE) criterion, familiar to those skilled in the art...)*

As per claim 7, claim 5 is incorporated and Chou further teaches the method comprising:

selecting of the processing parameter values of the speech recognition algorithm includes selecting values for parameters including one or more of an insertion factor, a recognition search beam width, a recognition grammar factor, and a number of recognition hypotheses. (Chou, column 6, lines 35-57, *...grammars may be manually derived directly from the task specification, or, alternatively, they may be generated automatically or semi-automatically (i.e., with human assistance) from a small corpus, using conventional training procedures familiar to those skilled in the art...*)

As per claim 8, claim 1 is incorporated and Chou further teaches the method comprising:

determining the representation of the query includes determining a network of the subword units. (Chou, column 6, lines 57-60, *... the key-phrase and filler-phrase grammars are compiled into networks..., column 5, lines 50-67, ...key-phrase detector 11 comprises a subword-based speech recognizer adapted to recognize a set of key-phrases using a set of phrase sub-grammars...*)

As per claim 9, claim 8 is incorporated and Chou further teaches the method comprising:

multiple sequences of subword units correspond to different paths through the network. (Chou, columns 6-7, lines 57-67, 1-5, Fig. 2)

As per claim 10, claim 1 is incorporated and Chou further teaches the method comprising:

determining the representation of the query includes determining an n-best list of recognition results. (Chou, column 7, lines 47-57, ...*N-best key-phrase candidates in the order of their scores...*)

As per claim 11, claim 10 is incorporated and Chou further teaches the method comprising:

each of the multiple sequences of subword units corresponds to a different one in the n-best list of recognition results. (Chou, column 7, lines 27-64)

As per claim 12, claim 1 is incorporated and Chou further teaches the method comprising:

accepting the first query data includes accepting first audio data representing the spoken utterances of the query spoken by a user, and processing the first audio data to form the first query data. (Chou, column 3, lines 49-52, ...*These key-phrases are then verified by assigning confidence measures thereto and comparing the confidence measures to a threshold, resulting in a set of verified key-phrase candidates...*)

As per claim 13, claim 1 is incorporated and Chou further teaches the method comprising:

accepting the first query data includes accepting a selection by a user of portions of stored data from the first set of audio signals, and processing the portions of the stored data to form the first query data. (Chou, column 3, lines 47-52, *...a plurality of key-phrases are detected (i.e., recognized) based on a set of phrase sub-grammars which may, for example, be specific to the state of the dialogue. These key-phrases are then verified by assigning confidence measures thereto and comparing the confidence measures to a threshold, resulting in a set of verified key-phrase candidates... the user's input is a first set of audio signals and key-phrase candidates are determined to form the first query data.*)

As per claim 14, claim 13 is incorporated and Chou further teaches the method comprising:

prior to accepting the selection by the user, processing the first set of audio signals according to a first computer-implemented speech recognition algorithm to produce the stored data. (Chou, column 3, lines 47-52, *...a plurality of key-phrases are detected (i.e., recognized) based on a set of phrase sub-grammars...*)

As per claim 15, claim 14 is incorporated and Chou further teaches the method comprising:

the first speech recognition algorithm produces data related to presence of the subword units at different times in first set of audio signals. (Chou, column 5, lines 60-65, ... *The subword model recognizer employed by key-phrase detector 11 uses lexicon 23 and subword models 22...*, For a full signal to be analyzed, there must be subword units for each definable subword unit meaning in the phrase, and the phrase would extend over a period of time, thus the subword units would as well. Furthermore, the speech Recognition algorithm would produce data from the subword units inherently, so it would also produce data related to presence of the subword units at different times in the audio signal.)

Claims 17 and 18 are the software and hardware representations of the method as claimed in claim 1. Claims 17 and 18 are rejected under the same principles as claim 1 for having identical limitations. Chou, column 12, lines 6-45, ... *Illustrative embodiments of the present invention may comprise digital signal processor (DSP) hardware, read-only memory (ROM) for storing software performing the operations discussed above, and random access memory (RAM) for storing results. Very large scale integration (VLSI) hardware embodiments, as well as custom VLSI circuitry in combination with a general purpose processor or DSP circuit, may also be provided...* Chou provides software and hardware illustrative embodiments which teach both claims 17 and 18.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. (US Patent #5797123 hereinafter Chou) in view of NPL document ("An overview of audio information retrieval" hereinafter Foote) and further in view of Thong et al. (US Pre-Grant Publication #20030110035 hereinafter Thong).

As per claim 16, claim 14 is incorporated and Chou and Foote fail to teach, but Thong teaches:

applying a second speech recognition algorithm to the query data  
(Thong, Fig. 2, Thong discloses the use of two separate algorithms applied to the query data. The first being the word comparison and the second being the subword comparison analogous to Chou.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Thong with the Chou device because Thong provides "modeling user input so as to take into account the acoustic inaccuracy by returning the most likely answers to the user." The Thong addition would benefit the Chou device by taking acoustic inflection into consideration in its speech recognition method.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to PTO-892, Notice of References Cited for a listing of analogous art.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREG A. BORSETTI whose telephone number is (571)270-3885. The examiner can normally be reached on Monday - Thursday (8am - 5pm Eastern Time).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, RICHMOND DORVIL can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Greg A. Borsetti/  
Examiner, Art Unit 2626

/Talivaldis Ivars Smits/  
Primary Examiner, Art Unit 2626

9/30/2008